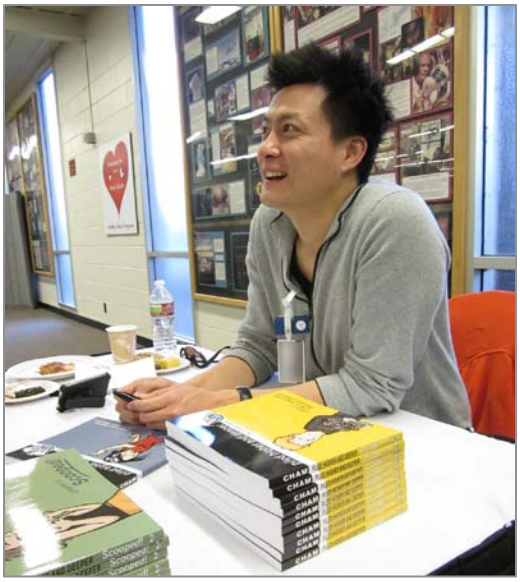
Paper/Work
LLNL Postdoc Association Newsletter
February 8, 2012 • Volume 1, Issue 8

"P.H.D." Postdocs and Other Grad School Survivors Enjoy Jorge Cham Visit



By Nathan Kugland

If you survived graduate school but haven't read the online comic strip "Piled Higher and Deeper" (P.H.D.), you have been missing out! Luckily, postdocs and staff employees at LLNL were treated to a celebrity visit and a chance to rectify this situation. On Thursday, January 26, Work-Life Programs, the Institutional Postdoc Program, and the Postdoc Association hosted cartoonist and humorist Jorge Cham for a day of fun and excitement. Jorge's internationally syndicated P.H.D. comic strip is known for its witty and painfully accurate descriptions of the graduate student experience, something to which many scientists and engineers at LLNL can relate. Jorge's visit started with a tour of NIF, which he described as "impressive." Afterwards the Postdoc Association took him to lunch at Garre Vineyard for a taste of Livermore wine country dining. In between explanations of the research interests of his lunch companions—along with the requisite explanations of the abundant acronyms commonly preferred over plain old words at LLNL—Jorge learned the basics of how NIF will achieve a burning plasma through inertial confinement fusion. He seemed to be listening quite attentively. Perhaps he will find inspiration for a future comic strip featuring postdocs from a certain national lab?

The day's main events started after lunch. At 2:30 PM Jorge started signing books in the B123 auditorium. We were very fortunate: Work-Life Events provided hundreds of complimentary copies of the first

Jorge Cham Visit, continued

three volumes of Jorge's P.H.D. comics so that each employee could have one as an autographed keepsake. The highlight of the day was Jorge's wildly funny lecture on procrastination, in which he explored the origin of his comic strip and its broad appeal. He also described the process by which he turned his wildly successful comic strip into the recently released short-format movie of the same name. When asked if there would be a sequel, Jorge admitted that a sequel depended on sales of the first movie.

After the presentation, the crowd headed over to the West Cafeteria for a splendid reception that was provided by Work-Life Programs. Jorge signed more books and greeted more fans while everyone enjoyed a diverse repast that included cake, cookies, beverages, sandwiches, pizza, and more. Art Wong, Associate Director of Human Resources, described the talk and reception as one of the best attended Work-Life events ever, a testament to the popularity of Jorge's work.

To finish the night in style, the Postdoc Association took Jorge out for a joint happy hour with Sandia postdocs at Concannon Vineyard's Underdog Wine Bar. Jorge was joined by over 30 people for drinks and more socializing before he left for the airport. Thanks to all who participated in the day's events!

Judges Needed for the Livermore Valley Science Odyssey

Help local K-12 kids by evaluating their science projects! February 29th – March 1st at Junction Avenue School. Contact Ms. Frankie Tate at Granada High School for more information or to volunteer:

ftate@lvjusd.k12.ca.us

Next Steps: Interviews with Former Postdocs

When will you end your Postdoc at LLNL?

Mani Sarathy: My last day at LLNL will be Feb 17, 2012. I joined here on January 19, 2010, so that makes me 25 months old since LLNL gave birth to me as a postdoc.

Where will you go next and how will the work compare to what you do as a postdoc?

On March 1, 2012 I will start working as an Assistant Professor at King Abdullah University of Science and Technology (KAUST) in Saudi Arabia. Naturally, my job responsibilities will be significantly different than my post-doc at LLNL. I will be responsible for teaching graduate level courses, mentoring students, and leading an independent research program. Additionally, I will be busy driving my wife everywhere, dressing her in a black robe whenever she leaves the house, tending my camels, and searching for oil in my backyard.

Did you apply elsewhere? Why this choice?

I did apply to several other positions. Most of them were for junior level faculty positions at Universities in the US or Canada. I did not apply to industry because I had worked in industry (petrochemical and wireless tech) during and after my undergraduate degree. At that time, I found that the lack of personal freedom in choosing the problems that I am interested in solving did not motivate me enough to stay in industry. I found academia to be the best place for my free spirited way of working. At LLNL, I found such freedom as a postdoc primarily because of the outstanding support of my advisor and peers. Our group works much like academia, and I was given flexibility in choosing my research path, writing papers, attending conferences, and developing collaborations. Everything about being at LLNL was exactly what I wanted from a career, and a tough choice was presented when I was offered the opportunity to stay beyond a postdoc instead of going to KAUST. My group here is established and well respected in the combustion research community, and working with them is very rewarding. However, I ultimately chose to leave because I want to experience the challenges of developing my own internationally recognized research program on my own. I believe this will help me grow as an individual and enable me to achieve greater success in my personal and professional life.

What did you enjoy the most and the least about being a postdoc at LLNL? What do you think are the differences between being a postdoc at the Lab versus at a University?

I most enjoyed my colleagues here at LLNL. They are stellar researchers and supportive friends. I am fortunate

that I will be able to continue working with them as an off-site collaborator after leaving the Lab. Regarding the differences between being a postdoc at the Lab versus at a university, I believe the workplace is far more structured here at the Lab. As a result, I feel it is a professional environment to work in and the quality of work is thus very high. I liked the pace of working in the Lab and find that structure and professionalism are imperative for working productively. I definitely did not feel like a student here at the Lab, which is what I think many postdocs at a university feel like.

How far along were you in your postdoc when you decided what the next step in your career would be?

Even before I started my postdoc, I knew it was not a forever position and considered it a stepping stone to something else. I was not sure what the next step would be, so I applied and networked for a number of different positions. One of my advisors here always told me to never stop looking for another opportunity even if I want to spend the rest of my life at LLNL. I think this was excellent advice because the exploration on its own opened many doors, all of which will benefit me now or in the future.

Can you describe the application and interview process? How did you get your new job? What do you think your employer valued the most in your formation and experience?

UC Berkeley Mechanical Engineering was handling the hiring for KAUST, and I applied for this job through a Cal Professor who was familiar with my work at LLNL. I was interviewed in Berkeley by the Mechanical

Next Steps: Interviews with Former Postdocs, Continued

Engineering Faculty, and several months later went to Saudi Arabia for a second interview. I was offered a job soon after my second interview. I think the employer most appreciated my ability to develop collaborations with international research institutes. During my postdoc at LLNL, I leveraged the reputation of my group to establish a number of research collaborations with groups in US, Canada, and Europe. I think the senior faculty at KAUST valued such outgoingness because it will be important in making their university globally relevant.

Any piece of advice for postdocs at LLNL?

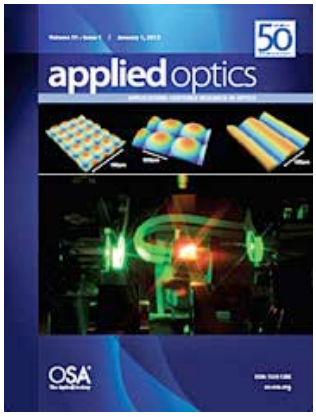
Please provide a project/task number first.

Postdoc-Related Highlights from Notes to the Director

Final set of optics for the Coherent X-ray Imaging beamline at LCLS

Installation of the Coherent X-ray Imaging (CXI) beamline at SLAC's Linac Coherent Light Source (LCLS) free-electron laser was finished during the first week of January 2012. This marks the completion of the LCLS Ultrafast Science Instrumentation (LUSI) project, which developed and installed three of the six experimental instruments that will enable LCLS to study the ultrasmall and the ultrafast. LLNL delivered the second (and final) pair of SiC-coated Kirkpatrick-Baez optics to SLAC on January 3, completing our contributions to this effort. We provided diffraction-limited, highly-reflective coated mirrors and extensive substrate metrology. LLNL's metrology revealed features (induced by the Si substrate vendor) on the surface of the Si substrate that were previously undisclosed and unknown to SLAC. Although marginally outside the mirror clear aperture, the presence of these features (had they remained undiscovered) could have hindered the performance of the CXI instrument. Now that the location and shape of these features is known due to the LLNL metrology, the CXI beam can be steered away from them. Regina Soufli of the Physics Division led the team responsible for successfully meeting this milestone. Other members of the team included Physics postdoc **Monica Fernandez-Perea**, and engineering staff members Sherry Baker and Jeff Robinson.

Mode conversion in rectangular-core optical fibers

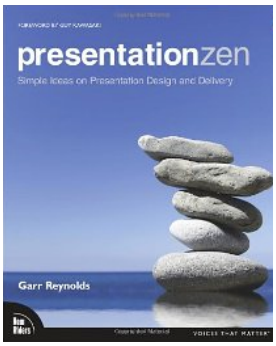


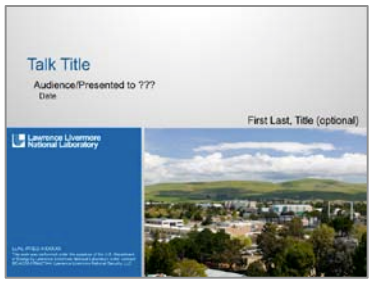
Compact, scalable high-power laser systems are used in defense applications, astronomy, remote sensing, gravitational-wave detection, and materials processing. Conventional circular-core optical fibers, however, face power-scaling limitations from thermal lensing and stimulated Raman scattering. The Photon Science & Applications fiber laser group is working to scale fiber lasers by changing the shape of the waveguide from a circularly symmetric fiber to a rectangular, or ribbon-shaped, fiber. Fibers with "ribbon" geometry allow for more efficient heat removal than a conventional fiber. The long-dimension of a rectangular core increases the surface area for heat removal, thus extending the thermal limit for power scaling. In the January 1 issue of *Applied Optics*, the researchers described a ribbon fiber with a uniform core and propagation of a higher-order mode as an avenue for power-scaling fiber lasers. Mode conversion from the fundamental to a higher-order mode in a rectangular-core optical fiber is accomplished by applying pressure with the edge of a flat plate. This pressure-plate method provides a simple and inexpensive means of converting power between modes of a ribbon fiber, thereby facilitating the ribbon fiber as a method of extending the power-scaling capabilities of optical fibers. Joining Amber Bullington in preparing the paper were Paul Pax, Arun Sridharan, John Heebner, Michael Messerly, and Jay Dawson.

Professional & Career Development

Better presentations at LLNL. In 2011, at the request of new Director Parney Albright, the Lab released a new template for all presentations, internal and external. More importantly, Dr. Albright wants us to give better presentations that are more effective and less cluttered. The book *Presentation Zen* by Garr Reynolds has a lot of great tips on how to do this: keep focused on one absolutely central point; limit the amount of text on slides and instead prepare notes and handouts; "Simplicity can be obtained through the careful reduction of the nonessential;" "bring energy and passion to your delivery." —Nathan Kugland

www.presentationzen.com
tid.llnl.gov/?q=resources-powerpoint_templates





Upcoming Events

Physics & Life Sciences Postdoc Research Seminar
Tuesday, February 21, 11 AM
B151 R1209 (Stevenson Room). Refreshments served.
• Sung Ho Kim "Exploration of the versatility of ring opening metathesis polymerization approach to low density polymeric aerogels"
• Tammy Olson "One-dimensional Nanostructures: Growth Mechanism, Assembly Manipulation, and Materials Applications"

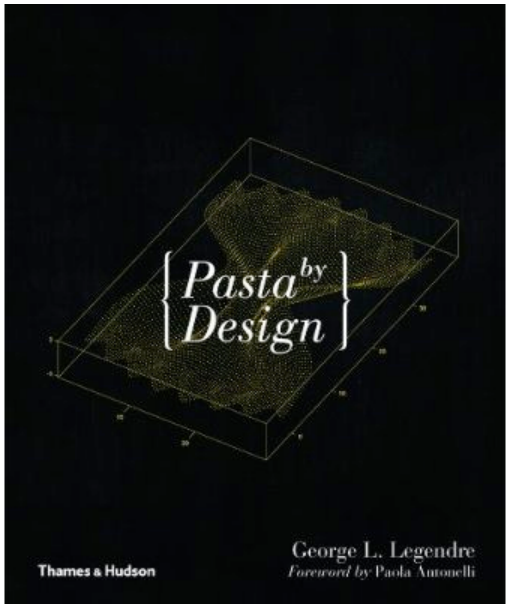
Conflict Resolution Brownbag Seminar at Sandia
Tuesday, February 21, 11:30 AM – 1 PM
Sandia B905 R210 (open campus area for US citizens)
"Strategies for Conflict Management: The 'I' of the Storm," presented by Reese Ramos, Sandia Ombudsman.
RSVP to Heather Jackson, hfjacks@sandia.gov
(Foreign nationals must coordinate access with Heather)

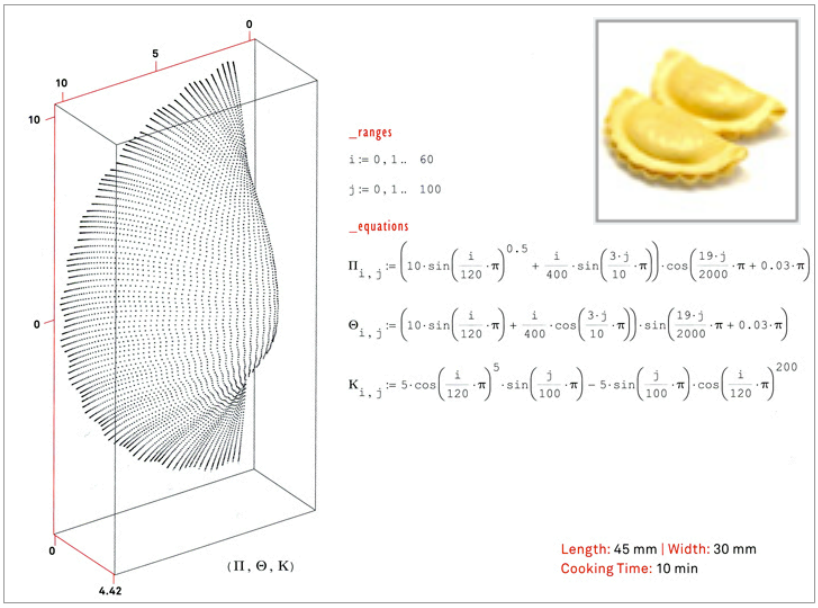
Mathematica 8 — Presented by Wolfram Research
Wednesday, February 22, in B453 R1012
• New features in Mathematica 8 (10 AM – 12 PM)
Statistics, Data analysis (import/export), Modeling and MathModelica, Curve Fitting and Matrix Operations, Control Systems and Wavelets, CDF Technology

• Live demos and tutorials (1:30 PM – 4:30 PM)
Users are welcome to bring questions on their work in Mathematica

In Other News… "Pasta by Design"

This new book by George L. Legendre features mathematical models for common pasta shapes. Fascinating! Shown here is ravioli plotted using what appears to be Mathematica. See more online:
www.nytimes.com/interactive/2012/01/10/science/20120110_pasta.html





From "Pasta by Design" by George L. Legendre

Selected Recent Research Publications by LLNL Postdocs

Bold = LLNL Postdoc. *Broadcast your achievements! Make new connections & help show how we are doing collectively.* **Guidelines**: 1) Peer-reviewed publications only, nothing in progress; 2) Your affiliation must be LLNL; 3) Note which authors are LLNL postdocs, and in what division & group; 4) Send full citation with all authors (no *et al*) and the title to Nathan (kugland1@llnl.gov).

Computing/CASC: **P. A. Lott**, H. Walker, C.S. Woodward and U.M. Yang, "An Accelerated Picard Method for Nonlinear Systems Related to Variably Saturated Flow," Advances in Water Resources (2012), pp. 92-101

Computing/CASC/Data Analysis Group: **Correa, C.**; Lindstrom, P.; Bremer, P.-T., "Topological Spines: A Structure-preserving Visual Representation of Scalar Fields," IEEE Transactions on Visualization and Computer Graphics, vol.17, no.12, pp.1842-1851, Dec. 2011

Computing/CASC/Data Analysis Group: **Correa, C.D.**; Lindstrom, P.; "Towards Robust Topology of Sparsely Sampled Data," IEEE Transactions on Visualization and Computer Graphics, vol.17, no.12, pp.1852-1861, Dec. 2011

PLS/Atmospheric, Earth, and Energy Division: **Chuanhe Lu**, Javier Samper, Bertrand Fritz, Alain Clement, Luis Montenegro, "Interactions of corrosion products and bentonite: An extended multicomponent reactive transport model," Physics and Chemistry of the Earth, Volume 36, Issues 17-18, 2011, 1661-1668.

PLS/Chemical Sciences/Environmental Radiochemistry: **Visser, Ate;** Kroes, Joop; Van Vliet, Michelle T.H.; Blenkinsop, Stephen; Fowler, Hayley J.; Broers, Hans Peter, "Climate change impacts on the leaching of a heavy metal contamination in a small lowland catchment," Journal of Contaminant Hydrology 127: 47-64 (2012)

PLS/Condensed Matter & Materials Division: **M. K. Santala,** B. W. Reed, T. Topuria, S. Raoux, S. Meister, Y. Cui, T. LaGrange, G. H. Campbell, and N. D. Browning, "Nanosecond in situ transmission electron microscope studies of the reversible Ge2Sb2Te5 crystalline <=> amorphous phase transformation," Journal of Applied Physics **111**, 024309 (2012).

PLS/Physics/Optical Sciences: **Lance M. Simms**, Willem De Vries, Vincent Riot, Scot S. Olivier, Alex Pertica, Brian J. Bauman, Don Phillion and Sergei Nikolaev, "Space-based telescopes for actionable refinement of ephemeris pathfinder mission," Opt. Eng. 51, 011004 (Jan 19, 2012); doi:10.1117/1.OE.51.1.011004

Notes from the Postdoc Association Council Meeting on February 1st, 2012

Start 12:00 PM, B543 Grand Canyon Room, Attendees: Lance Simms, Nathan Kugland, Andre Schleife, Adam Sorini, Eric Wang, Abhinav Bhatele, Liam Stanton, Christine Zachow

1. Summary of Jorge Cham event. It went very well: NIF tour, lunch, highly funny talk, reception with lots of food, and happy hour.

2. Andre reported on the clubbing event in San Francisco. About 10 people were there; he will provide photos for a future issue of Paper/Work.

3. Paper/Work Newsletter update. Nathan & Lance met with Breanna Bishop (public affairs officer) to feature our newsletter in NewsLine. Goal is to increase visibility & get more postdocs to participate in the LLPA and our events. Breanna can also get us some help to design a logo for the LLPA. Christine reports that the Paper/Work Newsletter is being well received by "everyone." Annie Kersting and Kris Kulp are sending it to upper management; they have responded by praising its quality. Could we get a separate budget for the newsletter? Christine will check.

4. Update on the feature article on postdocs who are parents. David Martinez is working on this; Nathan has received pictures.

5. Website recommendations from Abhinav. Currently we have 3 websites, lots of out of date info. Better to have a single place for postdocs, as do other national labs and universities. We could profile fellowship recipients to highlight work and awards, and also post LLPA council profiles. There is a larger lab-wide effort to redesign external pages so perhaps we can leverage that. Minor changes include adapting for smaller screens, updating old list of brown bag events. Also there are 3 contact emails—where do they all go?

Notes from the Postdoc Association Council Meeting, continued

Christine will see about getting Abhinav access to make small changes; must be approved by Kris Kulp beforehand.

6. Good response from Sandia postdocs to our recent happy hour; should try to do more joint events.

7. Brown bag ideas for the open campus: Lab people who have gone on to start companies; can ask for ideas from postdoc email list (send previous list of brown bags for inspiration)

8. T-shirt contest. Should be a lot of fun. Christine knows someone who has just researched t-shirt vendors. Lance said that Stanford Computing held a contest to design a t-shirt and it worked out really well. Would be a good giveaway for new postdocs; also great to have for the July barbecue (get a T-shirt for coming).

9. Next postdoc lunch will be in about 2 weeks.

The meeting ended with taking a group photo for NewsLine. End 1:00 PM.

Meet the Postdoc Association Leadership Council

Past-vice president Liam Stanton works with interdisciplinary models of warm dense matter

Hello there, I'm Liam and have been a postdoc at the Lab since '09. It's always a little difficult to describe what I do, because I'm one of those weird "interdisciplinary folk." For those of you who saw Jorge Cham speak last month and are a fan, check out his MadLib-style comic entitled "Interdisciplinary Madness!"; it's currently filled out in my office and pinned above my desktop.

I guess to put it briefly: if you had me speak with a physicist, a mathematician and a computer scientist (this is not the setup to a bad joke), the physicist would think I was a mathematician, the mathematician would think I was a computer scientist, and of course the computer scientist would think I was a physicist. All in all, people can only agree that I'm not one of them. To put my work more technically: I develop, analyze and vet mathematical and/or numerical models with applications to certain fields of physics. At the moment, this field is "warm dense matter" physics, which only makes things worse, as it is in itself an interdisciplinary field lying somewhere between plasma physics and condensed matter physics. This is by no means a complaint however — I love what I do! When you live in the gray areas of science, there are nothing but interesting new problems with no obvious answers in sight, and the challenges can be very rewarding.

If you think you recognize my name, it's probably because you've received many pesky emails from me about monthly postdoc lunches over the last year and a half. I joined the LLPA Council in '10 as vice president for a year and now continue to sit in as a council member. It's been a great opportunity to not only get involved with postdoc affairs here at the Lab but also to get to know great people who might not be doing research with you.

LLNL Postdoc Association Leadership Council

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Vice President Nathan Kugland
Handbook Editor Mandoye Ndoye
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